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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/606,176	06/25/2003	Osamu Goto	09792909-5625	3458

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EXAMINER

NADAV, ORI

ART UNIT PAPER NUMBER

2811

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/606,176

Applicant(s)

GOTO ET AL

Examiner

Ori Nadav

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 146-171, 173 and 175-205 is/are pending in the application.
- 4a) Of the above claim(s) 146-170 and 177-205 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 171, 173, 175 and 176 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 171, 173 and 175-176 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schetzina (5,670,798).

Schetzina teaches in figure 3 and related text a semiconductor light emitting device comprising:

an active layer 112 InGa<sub>N</sub> made of a first nitride III-V compound semiconductor containing In and Ga;

an optical guide layer GaN in contact with the active layer and made of a second nitride III-V compound semiconductor containing Ga (column 10, lines 31-34);

a cap layer AlGa<sub>N</sub> 114a in contact with the optical guide layer and made of a third nitride III-V compound semiconductor containing Al and Ga; and

a p-type clad layer AlGa<sub>N</sub> 122a in contact with the cap layer and made of a fourth nitride III-V compound semiconductor containing Al and Ga and different from the third nitride III-V compound semiconductor, wherein

the cap layer has a band gap larger than that of the p-type clad layer (see figure 4A), and wherein the cap layer is Al<sub>y</sub>Ga<sub>1-y</sub>N (where 0 ≤ y < 1).

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Schetzina does not teach the thickness of the cap layer which is located between the active layer and the cladding layer. Schetzina teaches in the embodiment of figure 30 the thickness of the active layer 112c as being between 3-10 nm, and the thickness of the barrier layer 112a located between the active layer and the cladding layer 114c as being 20-100 nm.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a cap layer, located between the cladding layer and the active layer, having a thickness between 2-20 nm, in Schetzina's device, in order to optimize the characteristics of the device according to the requirements of the application in hand, and in order not to deviate from the disclosed thicknesses of the various layers which determine the overall size of Schetzina's device.

It has been held in that the applicant must show that a particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Note that the law is replete with cases in which when the mere difference between the claimed invention and the prior art is some dimensional limitation or other variable within the claims, patentability cannot be found. The instant disclosure does not set forth evidence ascribing unexpected results due to the claimed dimensions. See Gardner v. TEC Systems, Inc., 725 F.2d 1338 (Fed. Cir. 1984), which held that the dimensional limitations failed to point out a feature which performed and operated any differently from the prior art.

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Note further that the broad recitation of the claim does not require the layers to be in direct contact with each other.

Regarding claim 175, Schetzina teaches in the embodiment of figure 3 substantially the entire claimed structure, as applied to claim 171 above, except an undoped optical guide layer. Schetzina teaches in the embodiment of figure 29 an undoped optical guide layer 124c. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an undoped optical guide layer in Schetzina's device in order to use the device in an application which requires an undoped optical guide layer.

Regarding claim 176, Schetzina does not teach an optical guide layer having a thickness equal to or more than 8 nm. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an optical guide layer having a thickness equal to or more than 8 nm, in Schetzina's device, in order to optimize the characteristics of the device according to the requirements of the application in hand.

### ***Response to Arguments***

Applicant argues that there is no suggestion to redesign Schetzina's device, as suggested by the examiner, to form cladding layer 114a with a thickness of 2-20nm in

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order to function as a cap layer, and to use graded layer 122a as a cladding layer.

Applicant further argues that this redesign could result in a non-functional device.

Two identical structures are not distinguished from each other just by labeling the layers with different names. Applicant forms an AlGaIn layer and calls it "a cap layer". Applicant then forms a p doped AlGaIn layer and calls it "a cladding layer". Schetzina forms a p doped AlGaIn layer and calls it "a cladding layer". Schetzina forms an AlGaIn layer and calls it "a graded layer". The two layers of Schetzina are identical to the two claimed layers, even though applicant labels these layers differently than Schetzina.

Furthermore, there is no evidence that using layer 114a of Schetzina as a cap layer, having a thickness of 2-20nm (which is identical to the claimed layer), would result in a non-functional device.

Note that forming layer 114a of Schetzina with a thickness of 2-20nm is not done to make it function as a cap layer. Cladding layer does not have to be between 200-500 nm in thickness, as argued by applicant. See, for example, US patent 6,515,313, wherein Ibbetson et al. teach a cladding layer having a thickness between 1-100 nm.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660. The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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A handwritten signature in black ink, appearing to read 'Ori Nadav', with a stylized, cursive script.

O.N.  
12/31/05

ORI NADAV  
PRIMARY EXAMINER  
TECHNOLOGY CENTER 2800